

2-08-2004

B020295

12 AUG '04 12:27 FROM

TO 0-09498923994465 P.07/09

-9-

CLAIMS

1.

An air transfer valve comprising:

- a housing connectable to a pipeline or vessel which conveys or contains liquid under pressure
- a first outlet from the housing to atmosphere,
- a control chamber exposed to internal pressure in the housing via a control chamber inlet,
- a first valve closure which is movable to open and close the first outlet and which is exposed to control chamber pressure tending to move it to close the first outlet and to internal housing pressure tending to move it to open the first outlet, whereby when the housing is pressurised the first valve closure is maintained in a position closing the first outlet solely by virtue of an unbalanced pressure force acting on it that is attributable to exposure of the first valve closure to atmosphere through the first outlet,
- a control chamber outlet from the control chamber to atmosphere which is larger than the control chamber inlet,
- a float movable vertically in the housing and arranged to be buoyed up by liquid entering the housing from the pipeline or vessel,
- a second valve closure attached rigidly to the float such that vertical movement of the float directly causes the same vertical movement of the second valve closure, the second valve closure being arranged to open and close the control chamber outlet in response to movement of the float caused by variations in the level of liquid in the housing,

APP 34 AMDT

Best Available Copy

2-08-2004

IB0202956

12 AUG '04 12:27 FROM

TO 0-09498923994465 P.08/09

-10-

the arrangement being such that vertical downward movement of the float in response to a drop in liquid level in the housing causes the same vertical downward movement of the second valve closure whereby the second valve closure opens the control chamber outlet to allow the control chamber to vent to atmosphere with the result that pressure in the control chamber drops relative to the internal housing pressure and creates an unbalanced pressure force on the first valve closure which causes it to open the first outlet, thereby allowing the housing to vent to atmosphere via the first outlet.

2.

An air transfer valve according to claim 1 wherein the first valve closure is carried by a resilient diaphragm one side of which is exposed to pressure in the control chamber and the other side of which is exposed to internal housing pressure.

3.

An air transfer valve according to claim 2 wherein the control chamber outlet extends through the first valve closure.

4.

An air transfer valve according to claim 3 wherein the control chamber outlet comprises a nozzle extending through the first valve closure and the second valve closure is carried by a nipple on the float which passes through an opening in the control chamber with a clearance which forms the control chamber inlet, the cross-sectional area of the nozzle being greater than that of the clearance.

ART 34 AMDT

Best Available Copy

12-08-2004

12 AUG '04 12:28 FROM

TO 0-09498923994465 P.09/09

IB020295

-11-

5.

An air transfer valve according to claim 4 wherein the first outlet, first valve closure and control chamber form a primary closure which is arranged to be raised by the float, to seat on and close a primary outlet from the housing, when the float is buoyed up by liquid in the housing.

6.

An air transfer valve according to claim 5 wherein the diaphragm spans across a hollow interior of the primary closure and subdivides that interior into the control chamber beneath the diaphragm and a space above the diaphragm which is exposed to internal housing pressure via ports in the primary closure.

ART 34 AMDT

AMENDED SHEET

Best Available Copy